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ABSTRACT

A survey of 857 students at a large midwestern university provided information regarding the frequency and type of drugs used by students at any time and shortly before driving. The drugs most frequently used at least once in the prior year were alcohol, marijauna, caffeine, and nicotine. Significant association was found between alcohol use shortly before or while driving and the variables of moving violations, accidents, age, sex, driving experience in years and class rank. Significant association was also found between driving under the effects of marijauna and variables of sex, number of miles driven per year, frequency of driving, accidents and moving violations, as well as between alcohol use and marijuana use shortly before or while driving. Narcotic use as well as LSD, chemical vapors, cocaine and barbituates did not appear to be major factors in regard to substance use shortly before or while driving by college students in this study. It is suggested that educational programs should emphasize the effects of drugs on driving ability. Several tables provide statistical analyses of the data. (JD)

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STUDENT DRUG USE AND DRIVING: A UNIVERSITY SAMPLE

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ABSTRACT

To provide educators with information regarding the frequency and type of drugs used, by students at any time and shortly before driving, a survey was taken at a large midwestern university. An anonymous questionnaire was utilized to obtain the information from a sample of about 3% of the student population. A response rate of 90.2% was calculated for 857 students, 55.7% females and 44.3%, males who returned the completed questionnaire. The survey provided biographical data of the respondents, their number of accidents, violations and miles driven in the previous 12 months, in addition to the frequencies of drugs used.

The drugs most frequently used at least once in the prior year were alcohol (63.9%), marijuana (34.1%), caffeine (75.9%) and nicotine (26.3%). Crosstabulation was employed in the final analyses to aid in the significant associations between designated variables. Chi-square analysis identified significant associations ($p < .001$) between alcohol use shortly before or while driving and the variables of moving violations, accidents, age, sex, driving experience in years and class rank. A significant association ($p < .001$) was found between driving under the effects of marijuana and the variables of sex, number of miles driven per year, frequency of driving, accidents and moving violations. Chi-square analysis also identified a significant association ($p < .001$) between alcohol use and marijuana use shortly before or while driving.

Narcotic use as well as LSD, chemical vapors, cocaine and barbituates do not appear to be major factors in regard to substance use shortly before or while driving by college students in this study.

The data suggests that a broad range of drug-use and risk taking behaviors should be addressed in educational programs and that information on the effects of other drugs (used alone and in combination with alcohol) on driving ability should also be emphasized.

INTRODUCTION

In recent years, deaths, disabilities and injuries from alcohol-related automobile accidents among young Americans have become recognized as serious public health problems. Young people, all too often combine drinking and driving with fatal results. Automobile accidents are a leading cause of death among 15-34 year olds (Healthy People, 1979). It is estimated that between 45% and 60% of all fatal crashes involving a young driver are alcohol related (DeLuca, 1981), and in any traffic accident, young drivers are more likely than older drivers to have been drinking (Douglas, 1982).

Although the studies examining the relationship between marijuana use and traffic accidents are fewer in number, there is increasing evidence that marijuana impairs sensory and perceptual functions, motor coordination, concentration and judgment. Marijuana users are also involved in a higher than average number of accidents (Nicholi, 1983; Marijuana and Health, 1982).

This investigation was conducted to gather information about the frequency and kind of drugs used by university students in general and shortly before or while driving a motor vehicle, and to identify any existing significant associations among biograhical, drug use and driving variables. The data was intended to serve as the basis for recommendation in the development of school - community health and safety education programs designed to promote responsible alcohol, drug use and driving behaviors.

METHOD

A survey instrument was devised consisting of a total of 35 questions. The first nine questions consisted of biographical data as well as mileage traveled, accidents and violations in the previous 12 months. The subsequent questions were concerned with the frequency of use of 6 categories of drugs (narcotics, sedatives, stimulants, hallucinogens and chemical vapors), to indicate use on any occasion and, to indicate when used shortly before or when driving. The frequency of use categories consisted of: daily use - once or twice a week, about once a month, less than ten times during the year, or never.

Four graduate students distributed the questionnaires in various locations about the University of Illinois campus over a 1 week period during the Spring semester 1982. These locations included residence halls, classrooms, cafeterias, libraries, etc. Names or other identifying information of the respondents were not obtained, therefore the survey was anonymous.

A total of 952 survey forms were handed out to the university students. Of these 5.3%, were completed by persons who were not enrolled at the university and those forms were discarded. In addition, 3.7% were not completed or not returned, while 0.8% of the students specifically refused to fill out the form. Thus, only 4.5% of the potential respondents specifically indicated a refusal to complete the questionnaire or for other reasons were not able to do so. In addition, a "lie detector" item in the survey consisted of a nonexistent drug in the drug listing was used by two respondents and their questionnaires were not included in the final set to be analyzed.

RESULTS

The distributions of class standing and sex of the sample are shown in Tables 1 and 2. Included for comparision purposes, are the actual distributions of all students enrolled at the university at the time the survey was carried out. The sample of 857 students represented about 2.7% of the total enrollment. It should be noted that there is close agreement between the distributions of the standing of the students at the university, as well as their gender. Thus, the sampling strategy appers to have worked well based on these variables.

- INSERT TABLES 1 AND 2 ABOUT HERE -

Table 3 indicates the distribution of age, years a driving license was held, the miles driven, the frequency with which the subjects reportedly drove, the number of accidents in which they were involved and the number of moving violations in the prior 12 months.

- INSERT TABLE 3 ABOUT HERE -

Examination of the modal categories of these data indicate that most subjects were aged 18-20 years, held a drivers license between 3 and 5 years, drove between 2-12,000 miles per year and drove occasionally. Eighty-four percent of the subjects were free of accidents in the last 12 months, while 12.2% had one accident, 2.3% had two accidents and about 1% had three accidents or more. Thus, there were a total of at least 133 accidents in the sample of 857 drivers; or on the average, 15.5% of the students had an accident in the last 12 months.

Similarly, Table 3 also shows that 77.8% of the students had no moving violations, while 15.9% had one violation, 5% had two and 1.3% had three

or more. Thus, there were at least a total of 190 violations incurred by this sample, with a mean of 22.1% of the sample having a moving violation in the prior 12 months.

Table 4 displays the reported frequency of use of the drugs listed in the survey and provides a comparison for use under any circumstance ("ever") and shortly before or while driving. This table indicates that alcohol, marijuana, nicotine and caffeine are clearly the most frequently used drugs by the students sample.

For example, 15.8% of the respondents indicated weekly - daily use of alcohol shortly before or while driving. For marijuana use, 6.3% of respondents operated a motor vehicle on a weekly - daily basis shortly before or while using this substance. The use of caffeine while driving on a weekly - daily basis was reported by 48% of the sample.

INSERT TABLE 4 ABOUT HERE -

The crosstabulation procedure was conducted on several biographical and drug use variables to investigate the possible existence of significant associations. The test utilized in determining the significance of the crosstabulation analysis was the chi-square statistic.

Crosstabulation for the variable of alcohol use while driving identified a number of significant associations with biographical variables. Table 5 summarizes the chi-square analysis of alcohol use shortly before or while driving.

-INSERT TABLE 5 ABOUT HERE -

A significant association ($p < .001$) between alcohol use and class rank was identified. The data indicate that approximately 52.7% of the weekly

- daily use of alcohol shortly before on while driving involved junior and senior students. The association between age of respondent and alcohol use while driving was also significant at the .001 level. The majority of students involved in this behavior (75.7%) are between the ages of 18-24.

Sex of the respondent also seems to have some influence on this behavior. Chi-square analysis identified a significant association ($p < .001$) between alcohol use while driving and the sex of student. Twice as many male students drove shortly after or while using alcohol on a weekly - daily basis, as did females in this study.

Analysis of the data through crosstabulation also found significant associations ($p < .001$) between alcohol use shortly before or while driving and the variables of driving experience in years, miles driven, driving frequency, moving violations and accidents in the prior 12 months. Most noteworthy are the data regarding accidents and moving violations. For those students involved in weekly - daily use of alchol shortly before or while driving, 22.3% had one moving violation and 10% were involved in two moving violations in the previous twelves months. Also, for students having at least one accident in the previous year, 21% drank and drove on a weekly - daily basis, for those reporting two crashes 3.7% and those with three or more accidents (2.1%) reported regular drinking and driving behavior.

Crosstabulation of the variables sex, miles driven, frequency of driving, moving violations and accidents with marijuana use shortly before or while driving revealed significant associations. Table 6 summarizes the chi-square analysis for these variables.

- INSERT TABLE 6 ABOUT HERE -

The only biographical variable with a significant association with marijuana use while driving was for "sex" at the .001 level. A majority of respondents have never used marijuana while driving, however, this practice on a weekly - daily basis is found in almost twice as many males as females. This finding is similar to that regarding alcohol use shortly before or while driving on a weekly - daily basis for this study.

Chi-square analysis for marijuana use and driving variables identified several significant associations. The data in Table 6 indicate that the majority of students who drive have never combined this activity with marijuana use. However, approximately 35.2% of those students who are weekly - daily users of marijuana shortly before or while driving, also exposed this behavior to approximately 5-12,000 miles of driving in the previous year. This association between driving frequency and marijuana use while doing so, was significant at the .01 level.

Also noteworthy of mention are the significant associations between moving violations in the past year ($p < .001$) and the frequency of accidents in the same 12 month period ($p < .05$) and marijuana use shortly before or while driving. For those students who reported weekly - daily use of marijuana while driving, 26% had at least one moving violation and 24% had one accident in the previous 12 months.

Crosstabulation was also employed to investigate the possible existence of significant associations among the various drug use while driving variables. A significant association ($p < .001$) between alcohol use while driving and marijuana use while driving was identified. Table 7

summarizes the chi-square analysis for these two variables. A majority of students in this sample do not combine the use of these drugs while driving. However, 50% of those who use marijuana and drive on a weely - daily basis, also report using alcohol shortly before or while driving on the same weekly - daily basis.

DISCUSSION AND CONCLUSIONS

The data presented here suggest several salient considerations for those involved in drug education and traffic safety programs. The general public might feel that the health and safety message has been delivered through mass media campaigns. However, it has not been received by young people who are most at risk. It appears that many university students are simply not aware of, or do not accept the findings regarding the extensive mortality and disability caused by motor vehicle accidents. It also appears that many respondents in this study are not aware of the dangers involved in driving under the influence of alcohol or marijuana. Reliable information on the effects of drugs continues to be important, however, these data suggest that a strong emphasis should be placed on the effects of alcohol and other drugs on driving ability. The responsibility and liability involved in operating a motor vehicle should also be stressed.

The need for energentic educational programs stressing the positive preventive aspects of responsible drug use and driving, aimed at university students, is one which holds a significant school and public health opportunity. While efforts continue in legal and medical settings, new and innovative educational opportunities need to be developed in the

college and university setting. Sound program planning and evaluation are needed to ensure the development and proper application of effective education strategies that will increase knowledge, promote positive attitude development and facilitate behavior change. Social learning, multidimensional and peer oriented strategies in this regard should be encouraged.

Although any student who combines drug use and driving is at risk, there is evidence here that heavier drinking, marijuana use and driving under the influence are highly associated. Drug and alcohol use appear to be components of a broad matrix of risk taking variables that need to be addressed in educational programs. For example, students who drove under the influence of alcohol were also more likely to have moving violations and traffic accidents. Students who drove under the influence of alcohol were also more likely to drive under the influence of marijuana.

The educational focus of primary prevention in drug education and traffic safety programs needs to be approached with the same enthusiasm, rigor, skills and resources which have characterized the more common health-behavior problems. The potential benefits of reducing the mortality, morbidity and trauma associated with drugs and alcohol related automobile accidents for university students provides the rationale for a concerted and immediate effort by health and safety educators.

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Table 1. Representativeness of the University of Illinois Sample by Class Rank in Percent

Groups	Freshmen %	Sophomore %	Junior %	Senior %	Graduate %
Sample	15	22.8	23.4	26.2	12.6
All Enrollees	18	22	24	24	12

Table 2. Representativeness of the University of Illinois Sample by Sex in Percent

Groups	Females %	Males %
Sample	55.7	44.3
All Enrolees	59	41

Table 3. Percent Distribution of Biographical and Driving Variables of the Sample

Age				
< 18	18-20	21-24	23-25	> 36
4.1	49.1	38.2	7.0	1.6

Years Held Driving License				
< 1	1-2	3-5	6-10	> 11
3.4	12.4	57.4	22.5	4.3

Miles Driven in Prior 12 Months			
< 2000	2-5000	5-12000	> 12000
33.7	29.7	24.0	12.6

Frequency of Driving	
Occasionally	Daily
62.9	37.1

Number of Accidents in Prior 12 Months			
0	1	2	3 or more
84.5	12.2	2.3	1.0

Number of Violations in Prior 12 Months			
0	1	2	3 or more
77.7	15.9	5.0	1.3

Table 4. Percent Frequencies of Drugs Used by University of Illinois Students

Drug	Never	<10/Year	Monthly	Weekly-Daily
Morphine, Heroin, Opium				
Ever	95.3	4.2	0.3	0.2
Driving	98.6	1.3	0.1	0.0
Codeine, Demerol, Methadone				
Ever	84.3	13.3	2.1	0.3
Driving	95.0	4.5	0.3	0.2
Alcohol				
Ever	12.4	11.1	20.3	56.2
Driving	36.2	28.1	19.9	15.8
Barbituates				
Ever	92.8	4.8	1.5	0.9
Driving	97.6	2.1	0.1	0.2
Cocaine				
Ever	81.9	14.5	2.8	0.8
Driving	93.7	5.0	1.0	0.3
Amphetamines				
Ever	82.1	9.4	5.2	3.3
Driving	90.3	6.4	2.1	1.2
LSD				
Ever	94.5	5.1	0.2	0.2
Driving	98.4	1.4	0.2	0.0
Marijuana				
Ever	47.3	19.9	13.4	19.4
Driving	65.9	18.6	9.2	6.3
Caffeine				
Ever	13.5	2.4	3.4	80.7
Driving	24.2	10.5	16.7	48.6
Nicotine				
Ever	69.6	4.3	2.4	23.6
Driving	73.7	4.8	4.4	17.1
Chemical Vapors				
Ever	97.7	1.3	0.5	0.6
Driving	99.4	0.2	0.1	0.2
Antihistamines				
Ever	78.3	12.9	5.2	3.5
Driving	87.4	9.3	1.4	1.8

Table 5. Chi-square Analysis of Alcohol Use While Driving (Continued)

Variable	Never Used	Less than 10 Times	Once a Month	1-2 Times/Week to Daily Use	Raw X^2	Significance
Driving Frequency						
Occasionally	235 (75.8)	169 (70.1)	96 (56.1)	40 (29.4)		
Most Days	74 (23.9)	72 (29.9)	75 (43.9)	96 (70.6)	100.31	$p < .001$
Miles Driven Last Year						
Less than 2,000	155 (50.0)	87 (36.1)	35 (20.5)	12 (8.8)		
2,000 - 5,000	75 (24.2)	91 (37.8)	60 (35.1)	29 (21.2)		
5,000 - 12,000	59 (19.0)	41 (17.0)	53 (13.5)	53 (39.0)		
More than 12,000	21 (0.6)	22 (3.7)	23 (2.9)	42 (3.0)		
Moving Violations Last Year						
None	262 (84.5)	195 (76.7)	122 (71.3)	88 (64.7)		
One	37 (11.9)	36 (4.6)	32 (18.7)	31 (22.3)	39.30	$p < .001$
Two	9 (2.9)	9 (15.0)	12 (7.0)	13 (10.0)		
Three or More	1 (0.6)	1 (3.7)	5 (2.9)	4 (3.0)		
Accidents Last Year						
None	274 (88.4)	209 (86.7)	144 (84.2)	98 (72.1)		
One	29 (9.4)	27 (11.2)	19 (11.1)	30 (22.1)	35.37	$p < .001$
Two	5 (1.6)	4 (1.7)	7 (4.1)	5 (3.7)		
Three or More	2 (0.6)	1 (0.4)	1 (0.6)	3 (2.1)		

Table 6. Chi-square Analysis of Marijuana Use While Driving

Variable	Never Used	Less than 10 times	Once a Month	1-2 Times/Week to Daily Use	Raw X^2	Significance
Sex						
Female	358 (63.4)	76 (47.5)	24 (30.4)	19 (34.0)		
Male	206 (36.5)	84 (52.5)	55 (69.6)	35 (66.0)	48.90	$p < .001$
Miles Driven Last Year						
Less than 2,000	218 (38.6)	38 (23.8)	20 (25.3)	13 (24.1)		
2,000 - 5,000	168 (29.7)	57 (35.6)	18 (22.8)	12 (22.2)	45.92	$p < .001$
5,000 - 12,000	128 (22.7)	35 (21.9)	24 (30.4)	19 (35.2)		
More than 12,000	51 (9.0)	30 (18.8)	17 (21.5)	10 (18.5)		
Driving Frequency						
Occassionally	384 (68.0)	92 (57.5)	36 (45.6)	28 (51.9)		
Most Days	180 (31.9)	68 (42.5)	43 (54.0)	26 (48.1)	22.70	$p < .001$
Moving Violations Last Year						
None	486 (82.8)	110 (68.8)	54 (68.4)	36 (66.7)		
One	76 (13.5)	33 (20.6)	13 (16.5)	14 (26.0)		
Two	19 (3.4)	11 (6.9)	10 (12.7)	3 (5.5)	56.88	$p < .001$
Three or More	2 (0.4)	6 (3.7)	2 (2.5)	1 (1.8)		
Accidents Last Year						
None	497 (88.0)	128 (80.0)	61 (75.9)	39 (68.4)		
One	51 (9.0)	25 (15.6)	15 (19.0)	14 (24.6)	26.03	$p < .05$
Two	9 (2.1)	6 (3.7)	3 (3.8)	3 (5.3)		
Three or More	4 (0.9)	1 (0.6)	1 (1.3)	1 (1.7)		

Table 7. Chi-square Analysis of Combined Marijuana Use and Alcohol Use While Driving

Alcohol Use While Driving	Marijuana Use While Driving: Never Used	Less Than 10 Times	Once a Month	1-2 Times/Week to Daily Use	Raw X^2	Significance
Never Used	286 (50.6)	12 (7.5)	5 (6.3)	7 (13.0)		
Less Than 10 Times	149 (26.4)	72 (45.0)	13 (16.5)	7 (13.0)	245.72	$p < .001$
Once a Month	80 (14.2)	49 (30.6)	29 (36.7)	13 (24.0)		
1-2 Times/Week to Daily Use	50 (8.8)	27 (16.9)	32 (40.5)	27 (50.0)		